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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,889

03/29/2006

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DK-US065037

9922

22919 7590 07/14/2008
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EXAMINER

DUFF, DOUGLAS J

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

07/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/573,889	Applicant(s) MASUDA, MASANORI	
	Examiner DOUGLAS J. DUFF	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This Office Action is in response to Applicant's amendments filed 4/24/08.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kampf (US 2561280) in view of Inagaki et al. (US 5165878). Regarding claim 1, Kampf discloses a rotary fluid machine comprising a cylinder (3) having an annular cylinder chamber formed as a space between a cylindrical inner periphery and a cylindrical outer periphery of the annular cylinder chamber, an annular piston (35) disposed in the chamber to be eccentric to the cylinder, the piston dividing the cylinder chamber into an outer working chamber (47) and an inner working chamber (49), the annular piston having a cylindrical inner piston surface facing the inner periphery of the cylinder chamber and a cylindrical outer piston surface facing the outer periphery of the cylinder chamber, and a blade (51) arranged in the cylinder chamber, the blade extending in a radius direction from the outer periphery to the inner periphery of the cylinder chamber to divide each of the outer and inner chambers into a high and low pressure region, the cylinder (3) and piston (35) making relative rotations. Kampf fails to disclose the cylinder chamber having a radial width measured between the inner and outer peripheries of the cylinder chamber that is varied about a circumference of the chamber

such that a gap between the inner periphery of the cylinder chamber and the inner piston surface of the piston and a gap between the outer periphery of the cylinder chamber and the outer piston surface of the piston are kept to a predetermined value during rotations.

3. Inagaki teaches a rotary fluid machine with a cylinder chamber (42) having a radial width measured between the inner and outer peripheries of the cylinder chamber that is varied about a circumference of the chamber (see Fig. 2, chamber width at top of 42 decreases to chamber width at left side of 42) such that a gap between the inner periphery of the cylinder chamber and the inner piston surface of the piston (32) and a gap between the outer periphery of the cylinder chamber and the outer piston surface of the piston are kept to a predetermined value (minimum) during rotations (col. 1, lines 60-65). It would have been obvious for a person having ordinary skill in the art at the time the invention was made to utilize a varying width in the cylinder chamber such that a gap is kept to a value in order for the piston and cylinder to have a sealed, precise interaction without efficiency losses due to increased power consumption and heat generation between the moving parts (col. 1, lines 61-65).

4. Regarding claim 2, the modified Kampf device discloses a rotary fluid machine comprising a cylinder (3) having an annular cylinder chamber formed as a space between a cylindrical inner periphery and a cylindrical outer periphery of the annular cylinder chamber, an annular piston (35) disposed in the chamber to be eccentric relative to the cylinder, the piston dividing the cylinder chamber into an outer working chamber (47) and an inner working chamber the annular piston having a cylindrical

inner piston surface facing the inner periphery of the cylinder chamber and a cylindrical outer piston surface facing the outer periphery of the cylinder chamber (49) and a blade (51) arranged in the cylinder chamber, the blade extending in a radius direction from the outer periphery to the inner periphery of the cylinder chamber to divide each of the outer and inner chambers into a high and low pressure region, the cylinder (3) and piston (35) making relative rotations without spinning by themselves, the piston (Inagaki 32) having a radial width measured between the inner and outer piston surfaces that is varied about a circumference of the piston (see Fig. 2 of Inagaki, left side of 32 inside chamber decreases at bottom end of 32 inside chamber) such that a gap between the inner periphery of the cylinder chamber and the inner piston surface of the piston and a gap between the outer periphery of the cylinder chamber and the outer piston surface of the piston are kept to a predetermined value (minimum) during rotations.

5. Regarding claim 3, the modified Kampf device discloses the rotary fluid machine of claim 2 including the cylinder chamber having a width that is varied along a circumference of the cylinder chamber (see Fig. 2, chamber width at top of 42 decreases to chamber width at left side of 42) such that a gap between a wall surface of the cylinder and a wall surface of the piston (32) is kept to a predetermined value (minimum) during rotations (col. 1, lines 60-65).

6. Regarding claims 4, 7, 11 and 14, the modified Kampf device discloses the machine of claim 3 including the blade (51) having a center line that is a starting point of the circumference, a width of a part of the cylinder chamber (inside 42, Inagaki) and a width of a part of the piston (32) ranging from the starting point to a point at a rotation

Art Unit: 3748

angle of 180 degrees from the starting point is larger (top starting point, Fig. 2, is large chamber width, small piston width) than a width of another part of the chamber and another part of the piston ranging from 180 degrees to 360 degrees from the starting point (270 degree point in Fig. 2, inside chamber 42, is small chamber width, large piston width).

7. Regarding claims 5, 8, 12 and 15, the modified Kampf device discloses the machine of claims 4 and 7 including a center of an inner circumference of the chamber (innermost end of 42, center of circumference is to the left in Fig. 2) deviated from a center of the outer circumference of the cylinder chamber (outer chambers of 42) and a center of an inner circumference of the piston (inside of 32) deviated from the center of an outer circumference of the piston (outermost end 32) when view along a longitudinal axis of the piston (Fig. 2).

8. Regarding claims 6, 9, 13 and 16, the modified Kampf device discloses the machine of claim 3 including the chamber and piston divided into four regions about the circumference thereof (0, 90, 180 and 270 degree points, Fig. 2) such that the cylinder chamber (42) has regions (0, 180) that are wider than other regions (90, 270) and the piston has two regions that are narrower (0, 180) than two other regions formed (90, 270) in a continuous and alternate manner.

9. Regarding claim 10, the modified Kampf device discloses the machine of claim 1 where the piston is C-shaped to form a gap (35, Kampf), the blade (51) extends from an inner wall surface to an outer wall surface of the cylinder chamber and passes through the gap of the piston (Fig. 1) and a swing bushing (67) is provided in the gap to contact

the piston and blade by surfaces thereof such that the blade (51) freely reciprocates and the blade and piston make relative swings (Fig. 1).

Response to Arguments

10. Applicant's arguments filed 4/24/08 have been fully considered but they are not persuasive. Regarding the argument that the compressor of Inagaki does not contain an annular cylinder chamber, the Examiner respectfully disagrees. Figure 2 of Inagaki shows the annular cylinder chamber. Alternatively, a scroll compressor is essentially the same as the Applicant's annular piston device, but with multiple stages. As the orbiting operation continues, the blade and cylinder chamber continue radially inward to allow successive compressing chambers to move on either side of the chamber and blade. Column 1 discusses the compliance issues encountered in the art of orbiting compressors. The motivation to combine Inagaki with Kampf is further explained in col. 4, lines 40-55, where Inagaki described that the thicknesses of the blade and chamber are designed as "required for proper slide-crank orbital motion of the first scroll".

11. Regarding the argument that the chamber of Inagaki does not make up a compressor chamber, the Examiner respectfully disagrees. As described above, the operation principles of the blade and cylinder chamber are such that the inner and outer chamber walls and blade continue radially inward to allow successive compressing chambers to move on either side of the chamber and blade (Fig. 2). Thus, the compressor of Inagaki encounters the same gas load problem as the Applicant's device.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS J. DUFF whose telephone number is (571)272-3459. The examiner can normally be reached on M-Th 7 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3748

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748

/Douglas J Duff/
Examiner, Art Unit 3748
7/10/08